



BEST AVAILABLE COPY

HOI-14402 ST25.txt
SEQUENCE LISTING

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Kempe, Thomas D.

<120> BINDING MEMBER TOWARDS PNEUMOCOCCUS SURFACE ADHESIN A PROTEIN
(PsaA)

<130> HOI-14402/16

<150> PCT/DK04/000492
<151> 2004-07-08

<150> US 60/486,647
<151> 2003-07-11

<150> PA 2003 01044
<151> 2003-07-08

<160> 56

<170> PatentIn version 3.3

<210> 1
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<212> DNA
<213> Homo sapiens

<220>
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<223> Sequence from human antibody generated in mouse.

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Arg Ala Ser Gln Gly Ile Ser Ser Trp Leu Ala
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33

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<213> Homo sapiens

<400> 2
Arg Ala Ser Gln Gly Ile Ser Ser Trp Leu Ala
1 5 10

<210> 3
<211> 21
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(21)
<223> Sequence from human antibody generated in mouse.

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<400> 3
gtt gca tcc agt ttg caa agt
Val Ala Ser Ser Leu Gln Ser
1 5

21

<210> 4
<211> 7
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<213> Homo sapiens

<400> 4
Val Ala Ser Ser Leu Gln Ser
1 5

<210> 5
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<213> Homo sapiens

<220>
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<223> Sequence from human antibody generated in mouse.

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Gln Gln Tyr Asn Ser Tyr Pro Pro Thr
1 5

27

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<400> 6
Gln Gln Tyr Asn Ser Tyr Pro Pro Thr
1 5

<210> 7
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and J-segment: JK1

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<222> (70)..(120)

<220>

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<221> CDR2
 <222> (148)..(168)

<220>

<221> CDR3
 <222> (265)..(291)

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 Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
 1 5 10 15

gac aga gtc acc atc act tgt cgg gcg agt cag ggt att agc agc tgg 96
 Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Gly Ile Ser Ser Trp
 20 25 30

tta gcc tgg tat cag cag aaa cca gag aaa gcc cct gag tcc ctg atc 144
 Leu Ala Trp Tyr Gln Gln Lys Pro Glu Lys Ala Pro Glu Ser Leu Ile
 35 40 45

tat gtt gca tcc agt ttg caa agt ggg gtc cca tca agg ttc agc ggc 192
 Tyr Val Ala Ser Ser Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
 50 55 60

agt gga tct ggg aca gat ttc act ctc acc atc agc agc ctg cag cct 240
 Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
 65 70 75 80

gaa gat ttt gca act tat tac tgc caa cag tat aat agc tat cct ccg 288
 Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Tyr Asn Ser Tyr Pro Pro
 85 90 95

acg ttc ggc caa ggg acc aag gtg gaa atc aaa 321
 Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
 100 105

<210> 8

<211> 107

<212> PRT

<213> Homo sapiens

<400> 8

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
 1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Gly Ile Ser Ser Trp
 20 25 30

Leu Ala Trp Tyr Gln Gln Lys Pro Glu Lys Ala Pro Glu Ser Leu Ile
 35 40 45

Tyr Val Ala Ser Ser Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
 50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
 65 70 75 80

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Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Tyr Asn Ser Tyr Pro Pro
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
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<210> 9
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Gly Phe Ser Trp Ser
1 5

15

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<212> PRT
<213> Homo sapiens

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Gly Phe Ser Trp Ser
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<212> DNA
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<223> Sequence from human antibody generated in mouse.

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gaa atc gat tat aga gga agc acc aac tac aac ccg tcc ctc aag agt
Glu Ile Asp Tyr Arg Gly Ser Thr Asn Tyr Asn Pro Ser Leu Lys Ser
1 5 10 15

48

cga
Arg

51

<210> 12
<211> 17
<212> PRT
<213> Homo sapiens

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Glu Ile Asp Tyr Arg Gly Ser Thr Asn Tyr Asn Pro Ser Leu Lys Ser
1 5 10 15

Arg

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ggg ggg ccc cgc ttt gac tac
Gly Gly Pro Arg Phe Asp Tyr
1 5

21

<210> 14
<211> 7
<212> PRT
<213> Homo sapiens

<400> 14

Gly Gly Pro Arg Phe Asp Tyr
1 5

<210> 15
<211> 345
<212> DNA
<213> Homo sapiens

<220>
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<223> Sequence from human antibody generated in mouse.
V-segment: 4-34, D-segment: unknown, J-segment: JH4b

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<222> (91)..(102)

<220>
<221> CDR2
<222> (148)..(199)

<220>
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<222> (191)..(312)

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Gln	Val	Arg	Leu	Gln	Gln	Trp	Gly	Ala	Gly	Leu	Leu	Lys	Pro	Ser	Glu	
1				5					10				15			
acc	ctg	tcc	ctc	acc	tgc	gct	gtc	ttt	ggg	tcc	ttc	agt	ggt	ttc		96
Thr	Leu	Ser	Leu	Thr	Cys	Ala	Val	Phe	Gly	Gly	Ser	Phe	Ser	Gly	Phe	
				20				25				30				
tcc	tgg	agc	tgg	atc	cgc	cag	acc	cca	ggg	aag	ggg	ctg	gag	tgg	atc	144
Ser	Trp	Ser	Trp	Ile	Arg	Gln	Thr	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Ile	
				35				40			45					
ggg	gaa	atc	gat	tat	aga	gga	agc	acc	aac	tac	aac	ccg	tcc	ctc	aag	192
Gly	Glu	Ile	Asp	Tyr	Arg	Gly	Ser	Thr	Asn	Tyr	Asn	Pro	Ser	Leu	Lys	
				50			55			60						
agt	cga	gtc	acc	ata	tta	aga	gac	acg	tcc	agg	agc	cag	ttc	tcc	ctg	240
Ser	Arg	Val	Thr	Ile	Leu	Arg	Asp	Thr	Ser	Arg	Ser	Gln	Phe	Ser	Leu	
				65			70			75			80			
aag	ttg	agc	tcc	gtg	acc	gcc	gcg	gac	tcg	gct	gtg	ttt	tat	tgt	gcg	288
Lys	Leu	Ser	Ser	Val	Thr	Ala	Ala	Asp	Ser	Ala	Val	Phe	Tyr	Cys	Ala	
				85			90					95				
aga	ggg	ggg	ccc	cgc	ttt	gac	tac	tgg	ggc	cag	gga	acc	ctg	gtc	acc	336
Arg	Gly	Gly	Pro	Arg	Phe	Asp	Tyr	Trp	Gly	Gln	Gly	Thr	Leu	Val	Thr	
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gtc	tcc	tca														345
Val	Ser	Ser														
				115												

<210> 16
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<400> 16

Gln Val Arg Leu Gln Gln Trp Gly Ala Gly Leu Leu Lys Pro Ser Glu
 1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Val Phe Gly Gly Ser Phe Ser Gly Phe
 20 25 30

Ser Trp Ser Trp Ile Arg Gln Thr Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Glu Ile Asp Tyr Arg Gly Ser Thr Asn Tyr Asn Pro Ser Leu Lys
 50 55 60

Ser Arg Val Thr Ile Leu Arg Asp Thr Ser Arg Ser Gln Phe Ser Leu
 65 70 75 80

Lys Leu Ser Ser Val Thr Ala Ala Asp Ser Ala Val Phe Tyr Cys Ala
 85 90 95

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Arg Gly Gly Pro Arg Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr
100 105 110

Val Ser Ser
115

<210> 17
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<220>
<223> synthetic

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<220>
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<222> (33)..(33)
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Arg Ala Ser Gln Ser Val Ser Ser Tyr Leu Ala
1 5 10

33

<210> 18
<211> 11
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<213> Artificial

<220>
<223> Synthetic Construct

<400> 18

Arg Ala Ser Gln Ser Val Ser Ser Tyr Leu Ala
1 5 10

<210> 19
<211> 21
<212> DNA
<213> Homo sapiens

<220>
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<222> (1)..(21)
<223> Sequence from human antibody generated in mouse.

<400> 19
gat gca tcc aac agg gcc act
Asp Ala Ser Asn Arg Ala Thr
1 5

21

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<210> 20
<211> 7
<212> PRT
<213> Homo sapiens

<400> 20

Asp Ala Ser Asn Arg Ala Thr
1 5

<210> 21
<211> 27
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(27)
<223> Sequence from human antibody generated in mouse.

<400> 21
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Gln Gln Arg Ser Asn Trp Pro Leu Thr
1 5

27

<210> 22
<211> 9
<212> PRT
<213> Homo sapiens

<400> 22

Gln Gln Arg Ser Asn Trp Pro Leu Thr
1 5

<210> 23
<211> 321
<212> DNA
<213> Homo sapiens

<220>
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<223> Sequence from human antibody generated in mouse. V-segment: L6
and J-segment: JK4

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<222> (70)..(102)

<220>
<221> misc_feature
<222> (102)..(102)
<223> unknown nucleotide

<220>
<221> CDR2

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<222> (148)..(168)

<220>

<221> CDR3

<222> (265)..(291)

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gaa att gtg ttg aca cag tct cca gcc acc ctg tct ttg tct cca ggg
Glu Ile Val Leu Thr Gln Ser Pro Ala Thr Leu Ser Leu Ser Pro Gly
1 5 10 15

48

gaa aga gcc acc ctc tcc tgc agg gcc agt cag agt gtt agc agc tac
Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Val Ser Ser Tyr
20 25 30

96

tta gcn tgg tac caa cag aaa cct ggc cag gct ccc agg ctc ctc atc
Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile
35 40 45

144

tat gat gca tcc aac agg gcc act ggc atc cca gcc agg ttc agt ggc
Tyr Asp Ala Ser Asn Arg Ala Thr Gly Ile Pro Ala Arg Phe Ser Gly
50 55 60

192

agt ggg tct ggg aca gac ttc act ctc acc atc agc agc cta gag cct
Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu Pro
65 70 75 80

240

gaa gat ttt gca gtt tat tac tgt cag cag cgt agc aac tgg cct ctc
Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Arg Ser Asn Trp Pro Leu
85 90 95

288

act ttc ggc gga ggg acc aag gtg gag atc aaa
Thr Phe Gly Gly Thr Lys Val Glu Ile
100 105

321

<210> 24

<211> 106

<212> PRT

<213> Homo sapiens

<400> 24

Glu Ile Val Leu Thr Gln Ser Pro Ala Thr Leu Ser Leu Ser Pro Gly
1 5 10 15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Val Ser Ser Tyr
20 25 30

Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile
35 40 45

Tyr Asp Ala Ser Asn Arg Ala Thr Gly Ile Pro Ala Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu Pro
65 70 75 80

HOI-14402 ST25.txt

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Arg Ser Asn Trp Pro Leu
85 90 95

Thr Phe Gly Gly Thr Lys Val Glu Ile
100 105

<210> 25
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<212> DNA
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<220>
<223> synthetic

<220>
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<222> (1)..(15)

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Ile Phe Gly Met Ser
1 5

15

<210> 26
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<220>
<223> Synthetic Construct

<400> 26

Ile Phe Gly Met Ser
1 5

<210> 27
<211> 51
<212> DNA
<213> Homo sapiens

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<223> Sequence from human antibody generated in mouse.

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aac ata aag caa gat gga agt gag aaa tac tat gtg gac tct gtg aag
Asn Ile Lys Gln Asp Gly Ser Glu Lys Tyr Tyr Val Asp Ser Val Lys
1 5 10 15

48

ggc
Gly

51

<210> 28

HOI-14402 ST25.txt

<211> 17
<212> PRT
<213> Homo sapiens

<400> 28

Asn Ile Lys Gln Asp Gly Ser Glu Lys Tyr Tyr Val Asp Ser Val Lys
1 5 10 15

Gly

<210> 29
<211> 57
<212> DNA
<213> Homo sapiens

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<221> CDS
<222> (1)..(57)
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Asp Arg Phe Tyr Tyr Gly Ser Gly Ser Tyr Tyr Tyr Tyr Tyr Asn Gly
1 5 10 15

atg gac gtc 57
Met Asp Val

<210> 30
<211> 19
<212> PRT
<213> Homo sapiens

<400> 30

Asp Arg Phe Tyr Tyr Gly Ser Gly Ser Tyr Tyr Tyr Tyr Tyr Asn Gly
1 5 10 15

Met Asp Val

<210> 31
<211> 384
<212> DNA
<213> Homo sapiens

<220>
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<222> (1)..(384)
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V-segment:3-7, d-segment: 3-10 and J-segment JH6b

<220>

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<221> CDR1
<222> (91)..(102)

<220>
<221> CDR2
<222> (148)..(198)

<220>
<221> CDR3
<222> (295)..(351)

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Glu Val Gln Leu Val Glu Ser Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15
tcc ctg aga ctc tcc tgt gca gcc tct gga ttc acc ttt aat atc ttt 96
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Asn Ile Phe
20 25 30
ggg atg agc tgg gtc cgc cag gct cca ggg aaa ggg ctg gag tgg gtg 144
Gly Met Ser Trp Val Arg Gin Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45
gcc aac ata aag caa gat gga agt gag aaa tac tat gtg gac tct gtg 192
Ala Asn Ile Lys Gln Asp Gly Ser Glu Lys Tyr Tyr Val Asp Ser Val
50 55 60
aag ggc cga ttc acc atc tcc aga gac aac gcc aag aac tca ctg tat 240
Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Ser Leu Tyr
65 70 75 80
ctg caa atg aac agc ctg aga gcc gag gac acg gct gtg tat tac tgt 288
Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95
gcg agg gat cgg ttt tac tat ggt tcg ggg agt tat tat tac tac tac 336
Ala Arg Asp Arg Phe Tyr Tyr Gly Ser Gly Ser Tyr Tyr Tyr Tyr Tyr
100 105 110
aac ggt atg gac gtc tgg ggc caa ggg acc acg gtc acc gtc tcc tca 384
Asn Gly Met Asp Val Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
115 120 125

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<211> 128
<212> PRT
<213> Homo sapiens

<400> 32

Glu Val Gln Leu Val Glu Ser Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Asn Ile Phe
20 25 30

Gly Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

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Ala Asn Ile Lys Gln Asp Gly Ser Glu Lys Tyr Tyr Val Asp Ser Val
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Ser Leu Tyr
65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Asp Arg Phe Tyr Tyr Gly Ser Gly Ser Tyr Tyr Tyr Tyr
100 105 110

Asn Gly Met Asp Val Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
115 120 125

<210> 33

<211> 33

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (1)..(33)

<223> Sequence from human antibody generated in mouse.

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Arg Ala Ser Gln Ser Val Ser Ser Tyr Leu Ala
1 5 10

33

<210> 34

<211> 11

<212> PRT

<213> Homo sapiens

<400> 34

Arg Ala Ser Gln Ser Val Ser Ser Tyr Leu Ala
1 5 10

<210> 35

<211> 21

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (1)..(21)

<223> Sequence from human antibody generated in mouse.

<400> 35

gat gca tcc aac agg gcc act
Asp Ala Ser Asn Arg Ala Thr

21

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1 5

<210> 36
<211> 7
<212> PRT
<213> Homo sapiens

<400> 36

Asp Ala Ser Asn Arg Ala Thr
1 5

<210> 37
<211> 30
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(30)
<223> Sequence from human antibody generated in mouse.

<400> 37
cag cag cgt agc aac tgg cct cca ttc act
Gln Gln Arg Ser Asn Trp Pro Pro Phe Thr
1 5 10

30

<210> 38
<211> 10
<212> PRT
<213> Homo sapiens

<400> 38

Gln Gln Arg Ser Asn Trp Pro Pro Phe Thr
1 5 10

<210> 39
<211> 324
<212> DNA
<213> Homo sapiens

<220>
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<222> (1)..(324)
<223> Sequence from human antibody generated in mouse.
V-segment: L6 and J-segment: JK3

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<222> (70)..(102)

<220>
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<222> (148)..(168)

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<221> CDR3
 <222> (265)..(294)

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	gaa aga gcc acc ctc tcc tgc agg gcc agt cag agt gtt agc agc tac	96	
	Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Val Ser Ser Tyr		
20	25	30	
	tta gcc tgg tac caa cag aaa cct ggc cag gct ccc agg ctc ctc atc	144	
	Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile		
35	40	45	
	tat gat gca tcc aac agg gcc act ggc atc cca gcc agg ttc agt ggc	192	
	Tyr Asp Ala Ser Asn Arg Ala Thr Gly Ile Pro Ala Arg Phe Ser Gly		
50	55	60	
	agt ggg tct ggg aca gac ttc act ctc acc atc agc agc cta gag cct	240	
	Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu Pro		
65	70	75	80
	gaa gat ttt gca gtt tat tac tgt cag cag cgt agc aac tgg cct cca	288	
	Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Arg Ser Asn Trp Pro Pro		
85	90	95	
	ttc act ttc ggc cct ggg acc aaa gtg gat atc aaa	324	
	Phe Thr Phe Gly Pro Gly Thr Lys Val Asp Ile Lys		
100	105		

<210> 40
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 <212> PRT
 <213> Homo sapiens

<400> 40

Glu Ile Val Leu Thr Gln Ser Pro Ala Thr Leu Ser Leu Ser Pro Gly			
1	5	10	15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Val Ser Ser Tyr		
20	25	30

Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile		
35	40	45

Tyr Asp Ala Ser Asn Arg Ala Thr Gly Ile Pro Ala Arg Phe Ser Gly		
50	55	60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu Pro			
65	70	75	80

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Arg Ser Asn Trp Pro Pro		
85	90	95

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Phe Thr Phe Gly Pro Gly Thr Lys Val Asp Ile Lys
100 105

<210> 41
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<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(15)
<223> Sequence from human antibody generated in mouse.

<400> 41
agc ttt tgg atg agc
Ser Phe Trp Met Ser
1 5

15

<210> 42
<211> 5
<212> PRT
<213> Homo sapiens

<400> 42
Ser Phe Trp Met Ser
1 5

<210> 43
<211> 30
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(30)
<223> Sequence from human antibody generated in mouse.

<400> 43
aac ata aag caa gat gga agt gag aaa ttc
Asn Ile Lys Gln Asp Gly Ser Glu Lys Phe
1 5 10

30

<210> 44
<211> 10
<212> PRT
<213> Homo sapiens

<400> 44
Asn Ile Lys Gln Asp Gly Ser Glu Lys Phe
1 5 10

<210> 45
<211> 54

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<212> DNA
<213> Homo sapiens

<220>
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<222> (1)..(54)
<223> Sequence from human antibody generated in mouse.

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Asp Arg Ile Thr Met Val Arg Pro Tyr Tyr Tyr Phe Tyr Asn Gly Leu
1 5 10 15
gac gtc
Asp Val 54

<210> 46
<211> 18
<212> PRT
<213> Homo sapiens

<400> 46
Asp Arg Ile Thr Met Val Arg Pro Tyr Tyr Tyr Phe Tyr Asn Gly Leu
1 5 10 15

Asp Val

<210> 47
<211> 381
<212> DNA
<213> Homo sapiens

<220>
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<222> (1)..(381)
<223> Sequence from human antibody generated in mouse.
V-segment: 3-7, D-segment: 3-10 and J-segment: JH6b

<220>
<221> CDR1
<222> (91)..(102)

<220>
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<222> (148)..(177)

<220>
<221> CDR3
<222> (295)..(348)

<400> 47
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Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

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tcc	ctg	aga	ctc	tcc	tgt	gca	gct	tct	gga	ttc	acc	ttt	agt	agc	ttt	96
Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Ser	Phe	
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tgg	atg	agc	tgg	gtc	cgc	cag	gct	cca	ggg	aag	ggg	ctg	gag	tgg	gtg	144
Trp	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val	
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gcc	aac	ata	aag	caa	gat	gga	agt	gag	aaa	ttc	tat	gtg	gac	tct	gtg	192
Ala	Asn	Ile	Lys	Gln	Asp	Gly	Ser	Glu	Lys	Phe	Tyr	Val	Asp	Ser	Val	
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Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ala	Lys	Asn	Ser	Leu	Tyr	
65								70				75			80	
ctg	caa	atg	aac	agc	ctg	aga	gcc	gag	gac	acg	gct	gtg	tat	tac	tgt	288
Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys	
85								90				95				
gcg	agg	gat	cgt	att	aca	atg	gtt	cgg	ccc	tat	tac	tac	tac	tac	aac	336
Ala	Arg	Asp	Arg	Ile	Thr	Met	Val	Arg	Pro	Tyr	Tyr	Tyr	Phe	Tyr	Asn	
100								105						110		
ggt	ctg	gac	gtc	tgg	ggc	caa	ggg	acc	acg	gtc	acc	gtc	tcc	tca	381	
Gly	Leu	Asp	Val	Trp	Gly	Gln	Gly	Thr	Thr	Val	Thr	Val	Ser	Ser		
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<211> 127
<212> PRT
<213> Homo sapiens

<400> 48

Glu Val Gln Leu Val Glu Ser Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Phe
20 25 30

Trp Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ala Asn Ile Lys Gln Asp Gly Ser Glu Lys Phe Tyr Val Asp Ser Val
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Ser Leu Tyr
65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Asp Arg Ile Thr Met Val Arg Pro Tyr Tyr Tyr Phe Tyr Asn
100 105 110

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Gly Leu Asp Val Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
 115 120 125

<210> 49
 <211> 930
 <212> DNA
 <213> Streptococcus pneumoniae

<220>
 <221> CDS
 <222> (1)..(930)
 <223> Sequence of Streptococcus pneumoniae surface adhesin A (PsaA)- A Variant

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1 5 10 15	
ctt gta gca tgt gct agc gga aaa aaa gat aca act tct ggt caa aaa	96
Leu Val Ala Cys Ala Ser Gly Lys Lys Asp Thr Thr Ser Gly Gln Lys	
20 25 30	
cta aaa gtt gtt gct aca aac tca atc atc gct gat att act aaa aat	144
Leu Lys Val Val Ala Thr Asn Ser Ile Ile Ala Asp Ile Thr Lys Asn	
35 40 45	
att gct ggt gac aaa att gac ctt cat agt atc gtt ccg att ggg caa	192
Ile Ala Gly Asp Lys Ile Asp Leu His Ser Ile Val Pro Ile Gly Gln	
50 55 60	
gac cca cac gaa tac gaa cca ctt cct gaa gac gtt aag aaa act tct	240
Asp Pro His Glu Tyr Glu Pro Leu Pro Glu Asp Val Lys Lys Thr Ser	
65 70 75 80	
gag gct gat ttg att ttc tat aac ggt atc aac ctt gaa aca ggt ggc	288
Glu Ala Asp Leu Ile Phe Tyr Asn Gly Ile Asn Leu Glu Thr Gly Gly	
85 90 95	
aat gct tgg ttt aca aaa ttg gta gaa aat gcc aag aaa act gaa aac	336
Asn Ala Trp Phe Thr Lys Leu Val Glu Asn Ala Lys Lys Thr Glu Asn	
100 105 110	
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Lys Asp Tyr Phe Ala Val Ser Asp Gly Val Asp Val Ile Tyr Leu Glu	
115 120 125	
ggt caa aat gaa aaa gga aaa gaa gac cca cac gct tgg ctt aac ctt	432
Gly Gln Asn Glu Lys Gly Lys Glu Asp Pro His Ala Trp Leu Asn Leu	
130 135 140	
gaa aac ggt att att ttt gct aaa aat atc gcc aaa caa ttg agc gcc	480
Glu Asn Gly Ile Ile Phe Ala Lys Asn Ile Ala Lys Gln Leu Ser Ala	
145 150 155 160	
aaa gac cct aac aat aaa gaa ttc tat gaa aaa aat ctc aaa gaa tat	528
Lys Asp Pro Asn Asn Lys Glu Phe Tyr Glu Lys Asn Leu Lys Glu Tyr	
165 170 175	
act gat aag tta gac aaa ctt gat aaa gaa agt aag gat aaa ttt aat	576

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Thr	Asp	Lys	Leu	Asp	Lys	Leu	Asp	Lys	Glu	Ser	Lys	Asp	Lys	Phe	Asn	
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Lys	Ile	Pro	Ala	Glu	Lys	Lys	Leu	Ile	Val	Thr	Ser	Glu	Gly	Ala	Phe	
195					200							205				
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Lys	Tyr	Phe	Ser	Lys	Ala	Tyr	Gly	Val	Pro	Ser	Ala	Tyr	Ile	Trp	Glu	
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Ile	Asn	Thr	Glu	Glu	Gly	Thr	Pro	Glu	Gln	Ile	Lys	Thr	Leu	Val		
225					230				235				240			
gaa	aaa	ctt	cgc	caa	aca	aaa	gtt	cca	tca	ctc	ttt	gta	gaa	tca	agt	768
Glu	Lys	Leu	Arg	Gln	Thr	Lys	Val	Pro	Ser	Leu	Phe	Val	Glu	Ser	Ser	
245					250							255				
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Val	Asp	Asp	Arg	Pro	Met	Lys	Thr	Val	Ser	Gln	Asp	Thr	Asn	Ile	Pro	
260					265							270				
atc	tac	gca	caa	atc	ttt	act	gac	tct	atc	gca	gaa	caa	ggt	aaa	gaa	864
Ile	Tyr	Ala	Gln	Ile	Phe	Thr	Asp	Ser	Ile	Ala	Glu	Gln	Gly	Lys	Glu	
275					280							285				
ggc	gac	agc	tac	tac	agc	atg	atg	aaa	tac	aac	ctt	gac	aag	att	gct	912
Gly	Asp	Ser	Tyr	Tyr	Ser	Met	Met	Lys	Tyr	Asn	Leu	Asp	Lys	Ile	Ala	
290					295						300					
gaa	gga	ttg	gca	aaa	taa											930
Glu	Gly	Leu	Ala	Lys												
305																

<210> 50
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 <213> Streptococcus pneumoniae

<400> 50

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 20 25 30

Leu Lys Val Val Ala Thr Asn Ser Ile Ile Ala Asp Ile Thr Lys Asn
 35 40 45

Ile Ala Gly Asp Lys Ile Asp Leu His Ser Ile Val Pro Ile Gly Gln
 50 55 60

Asp Pro His Glu Tyr Glu Pro Leu Pro Glu Asp Val Lys Lys Thr Ser
 65 70 75 80

HOI-14402 ST25.txt

Glu Ala Asp Leu Ile Phe Tyr Asn Gly Ile Asn Leu Glu Thr Gly Gly
85 90 95

Asn Ala Trp Phe Thr Lys Leu Val Glu Asn Ala Lys Lys Thr Glu Asn
100 105 110

Lys Asp Tyr Phe Ala Val Ser Asp Gly Val Asp Val Ile Tyr Leu Glu
115 120 125

Gly Gln Asn Glu Lys Gly Lys Glu Asp Pro His Ala Trp Leu Asn Leu
130 135 140

Glu Asn Gly Ile Ile Phe Ala Lys Asn Ile Ala Lys Gln Leu Ser Ala
145 150 155 160

Lys Asp Pro Asn Asn Lys Glu Phe Tyr Glu Lys Asn Leu Lys Glu Tyr
165 170 175

Thr Asp Lys Leu Asp Lys Leu Asp Lys Glu Ser Lys Asp Lys Phe Asn
180 185 190

Lys Ile Pro Ala Glu Lys Lys Leu Ile Val Thr Ser Glu Gly Ala Phe
195 200 205

Lys Tyr Phe Ser Lys Ala Tyr Gly Val Pro Ser Ala Tyr Ile Trp Glu
210 215 220

Ile Asn Thr Glu Glu Gln Gly Thr Pro Glu Gln Ile Lys Thr Leu Val
225 230 235 240

Glu Lys Leu Arg Gln Thr Lys Val Pro Ser Leu Phe Val Glu Ser Ser
245 250 255

Val Asp Asp Arg Pro Met Lys Thr Val Ser Gln Asp Thr Asn Ile Pro
260 265 270

Ile Tyr Ala Gln Ile Phe Thr Asp Ser Ile Ala Glu Gln Gly Lys Glu
275 280 285

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Glu Gly Leu Ala Lys
305

<210> 51
<211> 25
<212> PRT

HOI-14402 ST25.txt

<213> Streptococcus pneumoniae

<400> 51

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<210> 52

<211> 25

<212> PRT

<213> Streptococcus pneumoniae

<400> 52

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Ala Thr Asn Ser Ile Ile Ala Asp Ile
20 25

<210> 53

<211> 25

<212> PRT

<213> Streptococcus pneumoniae

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His Ser Ile Val Pro Ile Gly Gln Asp
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<210> 54

<211> 65

<212> PRT

<213> Streptococcus pneumoniae

<400> 54

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20 25 30

Leu Lys Val Val Ala Thr Asn Ser Ile Ile Ala Asp Ile Thr Lys Asn
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Ile Ala Gly Asp Lys Ile Asp Leu His Ser Ile Val Pro Ile Gly Gln
50 55 60

HOI-14402 ST25.txt

Asp
65

<210> 55
<211> 960
<212> DNA
<213> *Streptococcus pneumoniae*

<220>
<221> CDS
<222> (1)..(930)
<223> equence of *Streptococcus pneumoniae* surface adhesin A (PsaA)

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 Leu Val Ala Cys Ala Ser Gly Lys Lys Asp Thr Thr Ser Gly Gln Lys
 20 25 30

ctt aaa gtt gtt gct aca aac tca atc atc gct gat att act aaa aat 144
 Leu Lys Val Val Ala Thr Asn Ser Ile Ile Ala Asp Ile Thr Lys Asn
 35 40 45

att gct ggt gac aaa att gac ctt cat agt atc gtt ccg att ggg caa
 Ile Ala Gly Asp Lys Ile Asp Leu His Ser Ile Val Pro Ile Gly Gln
 50 55 60

gac cca cac gaa tac gaa cca ctt cct gaa gac gtt aag aaa act tct	240
Asp Pro His Glu Tyr Glu Pro Leu Pro Glu Asp Val Lys Lys Thr Ser	
65 70 75 80	

gag gct gat ttg att ttc tat aac ggt atc aac ctt gaa aca ggt ggc 288
 Glu Ala Asp Leu Ile Phe Tyr Asn Gly Ile Asn Leu Glu Thr Gly Gly
 85 90 95

aat gct tgg ttt aca aaa tta gta gaa aat gcc aag aaa act gaa aac 336
 Asn Ala Trp Phe Thr Lys Leu Val Glu Asn Ala Lys Lys Thr Glu Asn
 100 105 110

aaa gac tac ttc gca gtc agc gac ggc gtt gat gtt atc tac ctt gaa
 Lys Asp Tyr Phe Ala Val Ser Asp Gly Val Asp Val Ile Tyr Leu Glu
 115 120 125 384

ggt caa aat gaa aaa gga aaa gaa gac cca cac gct tgg ctt aac ctt
 Gly Gln Asn Glu Lys Gly Lys Glu Asp Pro His Ala Trp Leu Asn Leu
 130 135 140

gaa aac ggt att att ttt gct aaa aat atc gcc aaa caa ttg agc gcc 480
 Glu Asn Gly Ile Ile Phe Ala Lys Asn Ile Ala Lys Gln Leu Ser Ala
 145 150 155 160

aaa gac cct aac aat aaa gaa ttc tat gaa aaa aat tcc aaa gaa tat
 Lys Asp Pro Asn Asn Lys Glu Phe Tyr Glu Lys Asn Leu Lys Glu Tyr
 165 170 175

act gat aag tta gac aaa ctt gat aaa gaa agt aag gat aaa ttt aat 576
Page 23

HOI-14402 ST25.txt

Thr Asp Lys Leu Asp Lys Leu Asp Lys Glu Ser Lys Asp Lys Phe Asn			
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aag atc cct gct gaa aag aaa ctc att gta acc agc gaa gga gca ttc			624
Lys Ile Pro Ala Glu Lys Lys Leu Ile Val Thr Ser Glu Gly Ala Phe			
195	200	205	
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Lys Tyr Phe Ser Lys Ala Tyr Gly Val Pro Ser Ala Tyr Ile Trp Glu			
210	215	220	
atc aat act gaa gaa gga act cct gaa caa atc aag acc ttg gtt			720
Ile Asn Thr Glu Glu Gly Thr Pro Glu Gln Ile Lys Thr Leu Val			
225	230	235	240
gaa aaa ctt cgc caa aca aaa gtt cca tca ctc ttt gta gaa tca agt			768
Glu Lys Leu Arg Gln Thr Lys Val Pro Ser Leu Phe Val Glu Ser Ser			
245	250	255	
gtg gat gac cgt cca atg aaa act gtt tct caa gac aca aac atc cca			816
Val Asp Asp Arg Pro Met Lys Thr Val Ser Gln Asp Thr Asn Ile Pro			
260	265	270	
atc tac gca caa atc ttt act gac tct atc gca gaa caa ggt aaa gaa			864
Ile Tyr Ala Gln Ile Phe Thr Asp Ser Ile Ala Glu Gln Gly Lys Glu			
275	280	285	
ggc gac agc tac tac agc atg atg aaa tac aac ctt gac aag att gct			912
Gly Asp Ser Tyr Tyr Ser Met Met Lys Tyr Asn Leu Asp Lys Ile Ala			
290	295	300	
gga gga ttg gca aaa taa gacaagattt ctgaaggattt ggcaaaataaa			960
Gly Gly Leu Ala Lys			
305			

<210> 56
 <211> 309
 <212> PRT
 <213> *Streptococcus pneumoniae*

<400> 56

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Leu Val Ala Cys Ala Ser Gly Lys Lys Asp Thr Thr Ser Gly Gln Lys
 20 25 30

Leu Lys Val Val Ala Thr Asn Ser Ile Ile Ala Asp Ile Thr Lys Asn
 35 40 45

Ile Ala Gly Asp Lys Ile Asp Leu His Ser Ile Val Pro Ile Gly Gln
 50 55 60

Asp Pro His Glu Tyr Glu Pro Leu Pro Glu Asp Val Lys Lys Thr Ser
 65 70 75 80

HOI-14402 ST25.txt

Glu Ala Asp Leu Ile Phe Tyr Asn Gly Ile Asn Leu Glu Thr Gly Gly
85 90 95

Asn Ala Trp Phe Thr Lys Leu Val Glu Asn Ala Lys Lys Thr Glu Asn
100 105 110

Lys Asp Tyr Phe Ala Val Ser Asp Gly Val Asp Val Ile Tyr Leu Glu
115 120 125

Gly Gln Asn Glu Lys Gly Lys Glu Asp Pro His Ala Trp Leu Asn Leu
130 135 140

Glu Asn Gly Ile Ile Phe Ala Lys Asn Ile Ala Lys Gln Leu Ser Ala
145 150 155 160

Lys Asp Pro Asn Asn Lys Glu Phe Tyr Glu Lys Asn Leu Lys Glu Tyr
165 170 175

Thr Asp Lys Leu Asp Lys Leu Asp Lys Glu Ser Lys Asp Lys Phe Asn
180 185 190

Lys Ile Pro Ala Glu Lys Lys Leu Ile Val Thr Ser Glu Gly Ala Phe
195 200 205

Lys Tyr Phe Ser Lys Ala Tyr Gly Val Pro Ser Ala Tyr Ile Trp Glu
210 215 220

Ile Asn Thr Glu Glu Gly Thr Pro Glu Gln Ile Lys Thr Leu Val
225 230 235 240

Glu Lys Leu Arg Gln Thr Lys Val Pro Ser Leu Phe Val Glu Ser Ser
245 250 255

Val Asp Asp Arg Pro Met Lys Thr Val Ser Gln Asp Thr Asn Ile Pro
260 265 270

Ile Tyr Ala Gln Ile Phe Thr Asp Ser Ile Ala Glu Gln Gly Lys Glu
275 280 285

Gly Asp Ser Tyr Tyr Ser Met Met Lys Tyr Asn Leu Asp Lys Ile Ala
290 295 300

Gly Gly Leu Ala Lys
305